Evaluation of Soviet Pamphlet: **RESULTS OF EQUIPPING THE ROLLING STOCK OF RAILROADS IN THE USSR WITH THE SA-3 AUTOMATIC COUPLER**

The SA-3 automatic coupler is not a new design nor a Soviet design. It is a development of the Williston coupler, brought out in this country somewhere around the turn of the century. It is a good design, with some advantages over the Janney-type coupler used here, which was adopted in 1887. It might well have been the US standard except that when it came out the railroads already had adopted the Janney-type, with which it is not compatible, and had gone too far along this road to turn back.

The Soviet paper chiefly is a shrewd exercise in self-laudation in the guise of a technical contribution. There is little use of automatic couplers for freight cars in Europe; for various reasons the other European (including British) railroads have seen fit to use the screw-and-link coupler, and it is most unlikely that at this late date they will have much interest in going to an automatic coupler on any large scale. Their various formulas and estimates for savings, for reasons just outlined, are academic except to themselves.

Some sidelights of interest afforded by the paper include:

1. The continued interest in saving metal, mentioned both in the use of adapter chains and in the saving in weight through abolition or removal of buffers.

2. The relatively light weight of trains in the USSR "which has increased up to 3,000-4,000 tons." This seems to imply that the figures are top limit. The US average for all trains is around 3,100 gross tons, and many are over 10,000 tons.

3. The fact that the Soviets have not been able to lick the problem of automatic coupling of air and electric connections through the coupler, although this would give them a genuine world leadership in such technology.

4. The estimated saving of 6 hours in turn-around time per car through automatic as against handling coupling. Taken along with the earlier estimate of 45 minutes saving per switching operation per car, this appears to indicate an average of 8 switchings per car turn-around.

5. The ancillary (and perhaps sometimes unforeseen) expenses which are involved in the Soviet dieselization and electrification program. It may be that the automatic-coupler is not an effect of this program, but it is quite certain that full advantage cannnt be taken of the greater pulling power of the electric and diesel locomotives without equipping the cars with couplers which could stand the increased stress of longer trains with higher tonnage.

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Evaluation of Soviet Pamphlet: AUTOMATION OF CLASSIFICATION YARD OPERATIONS ON USSR RAILROADS

This paper appears to be follow-up of a US paper on the same subject presented in 1957. It indicates fairly clearly that the Soviets are well behind us in the techniques of yard automation.

For example, we have found that in general two or occasionally three stages of retardation will answer our needs; the Soviets speak of using four stages. The description of their retarders indicates that they are not nearly so efficient as ours and are, in fact, not satisfactory to the Soviets themselves.

The Soviets seem to measure rollability and acceleration of cars only on tangent track; we measure on both tangent and curved track.

The Soviets speak of "the accuracy of the retarder operation" being a factor in the number and distribution of retarders; we take such accuracy for granted, with our equipment.

Later on, the paper speaks of using the third and fourth stages of retardation to "compensate for any error in the operation of the car retarders and automation equipment," later shown as ± 10 per cent. This sounds as though there is still a large measure of manual operation, introducing the factor of human error. Such impression is borne out by the description of the duties of the towerman and the equipment on his control panel.

On the whole, one is justified in concluding from the Soviet paper that the automation of classification yards, as we understand and use the term, is still in the test and development stages with them. With us it has become routine and the equipment for automation is bought, sold, and installed as an ordinary commercial transaction.

Much of the discussion in the Soviet paper about the effects of low temperatures on car rollability and grease use will not be new to anyone, and appears to have been introduced simply to fill out a paper.

EVALUATION OF SOVIET PAMPHLET: MEASURING CAR SPEEDS WITH RADAR

In comment on the Soviet paper about automation of classification yards, it was pointed out that this paper seems to show fairly clearly that such automation as there is is in the test and development stage. Such comment is reinforced by the paper now under consideration.

Measurement of car speed by radar is basic to yard automation, because speed into, through, and out of the system is a controlling factor. The closing paragraph of the Soviet paper makes it clear that in 1958 the design and performance of Soviet radar speed-measurement (and other yard automation) equipment is still under test. With us this equipment is so well established that it is bought and sold like any other commercial commodity.

The speed-measurement equipment is bought as part of a package, and probably the manufacturers of such equipment (Union Switch & Signal Company and General Railway Signal Corp.) would be best qualified to evaluate the worth of the Soviet technique as presented in the paper. However, the sketch looks to a layman as though it were much like our corresponding equipment, with nothing new or novel. One might guess that it is intended to look impressive without getting into details upon which the Soviets might find it awkward to be questioned. The system discussed in this paper is, in fact, very elementary and far below acknowledged Soviet capabilities in radar technology.

Evaluation of Soviet Pamphlet: HARDENING BY ROLLING OF CAR AND LOCOMOTIVE AXLE JOURNALS EQUIPPED WITH ROLLER BEARINGS

It is interesting that the paper apparently is based upon the technique for photo-elastic study of stresses by means of "frozen" sections. This technique was pioneered and developed in the US, by Prof. Max Frocht, who was born in Russia but was educated in this country and has done all his work here.

In the letter of transmittal from the UN, the title of the paper is listed as "COLD WORKING BY BURNISHING OF ROLLER BEARING JOURNALS." Burnishing of all car axles is routine in this country, and cold-rolling of roller-bearing axles is done by many railroads, though not mandatory. Hence, the theory holds nothing new for us.

The hardening effects of burnishing or cold-rolling are well known, so that the paper opens no new ground in this respect. Whether the Soviet method is better than some other method is a detail of shop practice which calls for the judgment of a specialist in such matters. In any event, the subject is so limited in scope that any new procedures or improvements are unlikely to be of major importance or concern, except to technicians in the field.

I do not know to what extent roller bearings have been introduced on freight cars in Europe but, because of their relatively small size and weight of most European cars it would seem probable that the Soviet paper would not have much application in this field. With American theory and practice well known to the Europeans, it would appear unlikely that the Soviet paper would be of extraordinary interest to them in connection with passenger-car and locomotive axles.

Evaluation of Soviet Pamphlet: APPLICATION OF ELECTROLYTIC ZINC TO SEATING SURFACES OF INNER RACES OF ROLLER BEARINGS

In US practice roller bearings are bought as a package from suppliers. Whether any American railroad would be interested in such a procedure as is described in the Soviet paper appears doubtful. For reasons outlined in comment on the Soviet paper on burnishing of cold-rolling roller-bearing axles, it is also questionable whether European railroads would have any considerable interest in this paper.

In any event, the procedure is a detail of shop practice which only specialists in this line would have the necessary competence for meaningful evaluation. One may doubt that such evaluation would reveal any significant progress in this field by the Soviets. Again, this is not to decry the value of improvements but simply to try to keep them in perspective. From a layman's viewpoint, the USSR procedure would appear to involve excessively high labor cost by US standards.

EVALUATION OF SOVIET PAMPHLET: INSULATING OF RAILS FROM REINFORCED CONCRETE CROSS TIES

One of the problems in using concrete cross ties is that of insulating rails for signal circuits. One method is by use of rubber or similar pads under the rails. The difficulty here is to find material with necessary insulating properties which will withstand weather, temperature, and wear under traffic.

The Soviet paper describes experiments and the results of some of these experiments with the use of rubber and rubber-like pads, but it does not give the composition of the substances used. From the last sentences of the paper it is clear that the matter is still in the test and experimental stage.

The Soviets are interested in using concrete ties to avoid the long hauls in the use of wood ties. Use of concrete ties involves many problems of construction, installation, maintenance, and signal operation. Hence, the need for the Soviets to minimize internal railroad demands on the hauling capacity must be great for them to be willing to sacrifice the relative merits of wood ties in all these respects and be willing to undertake all the problems of using concrete ties. Concrete ties are widely used in Europe, but there it is a question of non-availability of wood ties in adequate quantity.

In the United States we use no concrete ties, so that this subject is not of interest to American railroads. However, we do make considerable use of tie pads under rail, as a means of extending cross-tie life, and have had good results.